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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/663,593	09/18/2000	Raymond Van Roijen	PHN 17,638	4051

7590

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EXAMINER

DICKEY, THOMAS L

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 03/14/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/663,593

Applicant(s)

VAN ROIJEN ET AL.

Examiner

Thomas L Dickey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 6, 8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 6 and 8 is/are rejected.
- 7) ☐ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 22 May 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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## **DETAILED ACTION**

1. The amendment filed 11 November 2002 has been entered.

### ***Drawings***

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 22 May 2002, have been approved.

### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

4. The title of the invention is not descriptive. A new title, such as "LDMOS WITH GUARD RING (OF SAME TYPE AS DRAIN) SURROUNDING THE DRAIN" is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Isohata et al. (JP 10321842 A).

Isohata et al. discloses a semiconductor device comprising a semiconductor body having a first region 12a of a first conductivity (n) type and, adjacent thereto, a second region 1 of the second, opposite (p), conductivity type, a third region 12b2 of the first conductivity (n) type, which is adjacent the second region 1 and separated from the first region 12a by the second region 1, and a fourth region 12b1 of the first conductivity (n) type which is separated from the second region 1 by the third region 12b2 and which has a higher doping concentration than the third region 12b2, the first, the second and the fourth region 12b1 being provided with a terminals 18a and/or 18b, wherein the third region 12b2 is provided with a protection zone 20 of the first conductivity (n) type having a higher doping concentration than the third region 12b2, which protection zone 20 is separated from the second region 1 by the third region 12b2 and is situated near the fourth region 12b1 and around the fourth region, and separated from said fourth region 12b1 by an intermediate, comparatively high-impedance region, wherein the third region 12b2 and the fourth region 12b1 form, respectively, a drift region and a drain region of a lateral DMOS transistor. Note figures 2A and 2B of Isohata et al. Note that because of statements found in the application on page 6 lines 20 and 32-34, it is understood that applicant does not intend the claim term "around" to mean a literal enclosure.

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***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Isohata et al. (JP 10321842 A) in view of Wondrak et al. (5,578,859).

Isohata et al. discloses a semiconductor device comprising a semiconductor body having a first region 12a of a first conductivity (n) type and, adjacent thereto, a second region 1 of the second, opposite (p), conductivity type, a third region 12b2 of the first conductivity (n) type, which is adjacent the second region 1 and separated from the first region 12a by the second region 1, and a fourth region 12b1 of the first conductivity (n) type which is separated from the second region 1 by the third region 12b2 and which has a higher doping concentration than the third region 12b2, the first, the second and the fourth region 12b1 being provided with a terminals 18a and/or 18b, wherein the third region 12b2 is provided with a protection zone 20 of the first conductivity (n) type having a higher doping concentration than the third region 12b2, which protection zone 20 is separated from the second region 1 by the third region 12b2 and is situated near the fourth region 12b1 and around the fourth region, and separated from said fourth region 12b1 by an intermediate, comparatively high-impedance region. Note figures 2A and 2B

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of Isohata et al. Note that because of statements found in the application on page 6 lines 20 and 32-34, it is understood that applicant does not intend the claim term "around" to mean a literal enclosure.

Isohata et al. does not disclose that the device is of the RESURF type, wherein the product of the thickness and the doping concentration of the third region is approximately  $10^{12}$  atoms per  $\text{cm}^2$ .

However, Wondrak et al. discloses a semiconductor device with a third region of the first conductivity type, which is adjacent the second region and separated from the first region by the second region, that forms a drift region of a Lateral DMOS transistor, where the device is of the RESURF type, and therefore the product of the thickness and the doping concentration of the third region meets the well known RESURF criterion of being approximately  $10^{12}$  atoms per  $\text{cm}^2$ . Note column 2 lines 30-37 of Wondrak et al. Therefore, it would have been obvious to a person having skill in the art to replace the third region of the first conductivity type of Isohata et al.'s semiconductor device with the third region of the first conductivity type, which is adjacent the second region and separated from the first region by the second region, that forms a drift region of a Lateral DMOS transistor, where the device is of the RESURF type, and therefore the product of the thickness and the doping concentration of the third region meets the well known RESURF criterion of being approximately  $10^{12}$  atoms per  $\text{cm}^2$ , such as taught by Wondrak et al. in order to reduce the surface field of the lateral DMOS to thus provide a better breakdown voltage.

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***Allowable Subject Matter***

7. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

8. Applicant's arguments with respect to claims 6 and 8 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 703-308-0980. The examiner can normally be reached on Mon-Thu 8-6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 703-308-0980. The examiner can normally be reached on Mon-Thu 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

**TLD**  
**02/2003**

*denied*